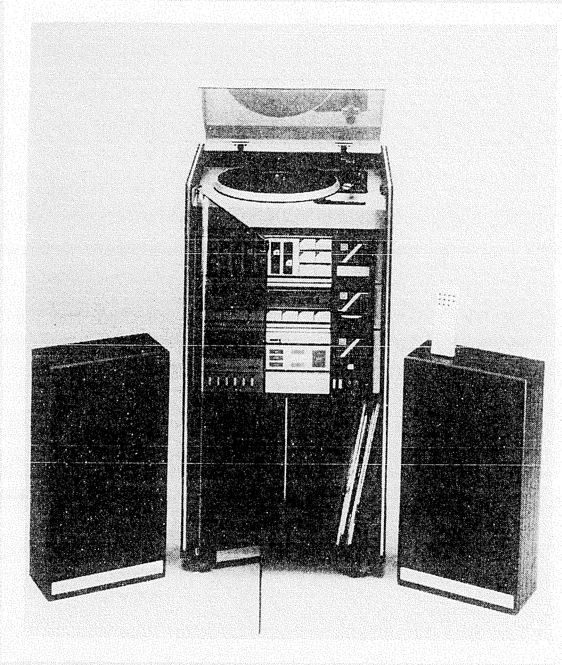
AMSTRAD



TS86/87
REMOTE CONTROL TOWER SYSTEM

SERVICE MANUAL

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TECHNICAL SPECIFICATION

Power Output	: 8 Watts RMS per channel into 4 ohms
Frequency Response	: 30Hz–20kHz
Distortion	: 1% @ 1kHz Full Power
	: 0.2% @ 1kHz Half Power
Graphic Equaliser	: 50Hz ±12dB
	: 150Hz ±12dB
	: 400Hz ±12dB
	: 1kHz ±12dB
	: 2.5kHz ±12dB
	: 5kHz ±12dB
	: 15kHz ±12dB
Filters	: Rumble −10dB @ 100Hz
	: Scratch −10dB @ 10kHz
	: Loudness +10dB @ 100Hz
	: +6dB @ 10kHz
Signal to noise ratio	: Better than 55dB
TUNER SECTION	
FM Section	: 86.5 – 109MHz
MW Section	: 525 – 1680kHz
LW Section	: 155 – 280kHz
FM Sensitivity	: 2.5uV
FM Aerial Input	: 75 ohms
CASSETTE SECTION	
Tape	: Cassette Type
Tape Speed	: 4.75cm per second (TS87 only - 9.5cm per second @ Hi-Speed Dubbing)
Tracks	: 2 Track Stereo
Wow and Flutter	: 0.2% WRMS
Distortion	: Less than 1% @ 1kHz
Frequency Response	: 30Hz – 14kHz
Microphone Sensitivity	: 0.5mV – 600ohms
TURNTABLE	
Cartridge	: TC-12M
Transmission	: Belt Drive
Speed Control	: Electronic
REMOTE CONTROL UNIT	
Method of Transmission	: Infra Red-Pulse Position Modulation (PPM)
Volume Up/Down	: 0dB max −80dB min
Balance Left/Right	: −25dB attenuation per channel
Bass Up/Down	: ±10dB @ 100Hz
Treble Up/Down	: ±10dB @ 10kHz
Batteries	: 2 x 1.5V Leak Proof Type Hitachi Maxell 200, Ever Ready R6PP or equivalent.
DIMENSIONS AND WEIGHT	
Main Unit	: H-86cm, W-43cm, D-39cm
	: Weight 25.0Kg
Speakers	: H-49cm, W-26cm, D-13cm
	: Weight 3.0Kg each
Mains Voltage	: 220-240V AC 50Hz

Safety

All units are tested to the following safety specification during manufacture:-

1. **Flash Test:** Tested at 2.2kV between live and neutral of the mains lead joined together and all accessible metal points on the exterior of the set.
2. **Insulation resistance test:** Tested between the live and neutral of the mains lead joined together and all accessible metal points on the exterior of the set to show a resistance of at least 4Mohms at 500V DC.
3. **Earth lead continuity test:** Tested for a continuity of less than 0.5ohms at 10 Amps between the earth of the mains lead and the record deck transit screw.

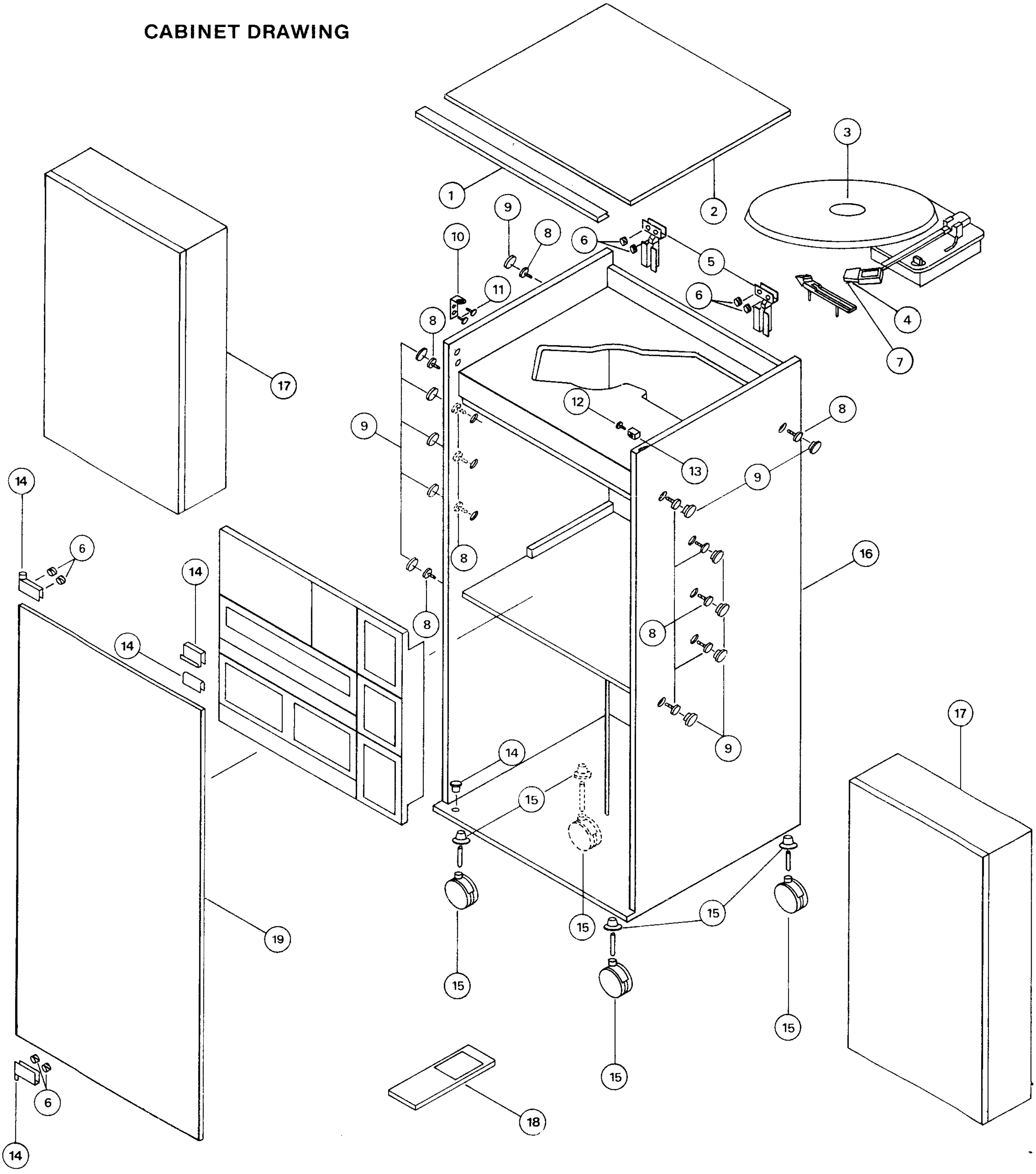
If there are any doubts about continued electrical safety after servicing, the above tests should be carried out.

AMSTRAD CONSUMER ELECTRONICS PLC
BRENTWOOD HOUSE, 169 KINGS ROAD,
BRENTWOOD, ESSEX CM14 4EF.
Telephone: Brentwood (0277) 228888
Telex: 995417 AMSELE G.

GENERAL TROUBLE SHOOTING GUIDE

SYMPTOMS	FAULT	CURE
All functions on unit fail to operate.	Lack of power supply.	Check mains plug/mains fuse.
All functions fail to operate except record deck mechanism.	Fuse TF501 blown. If fuse continues to blow check for faulty mains transformer.	Replace. Check and replace as necessary.
All functions fail to operate except record deck mechanism.	Fuses 502 or 503 blown. If either fuse continues to blow. If fuse still continues to blow.	Replace as necessary. Check Bridge Rectifier or Power IC. General circuit fault. Check and repair as necessary
VU LEDs not working.	Connecting plug between cassette section and main amplifier not locating properly.	Re-locate.
FM Tuner section selects no station but gives loud hiss.	Aerial not connected or aerial faulty. If there is no fault in aerial.	Check aerial and replace or repair as necessary. General circuit fault in FM stage. Check and repair as necessary.
FM Tuner gives some sound but poor quality.	Poor aerial: 75ohm downlead broken. If aerial and leads are ok.	Repair/replace as necessary. General FM circuit fault. Check and repair as necessary
FM works, but stereo light inoperative.	Decoder incorrectly aligned. LED Faulty. Check decoder IC201. If IC201 ok, fault is probably C211 (220pF Poly).	Re-align decoder (see alignment instructions) Replace. Check and replace as necessary. Check and replace as necessary.
AM radio section (MW/LW) inoperative or very weak.	Incorrect alignment. If alignment correct.	Check and re-align as necessary Circuit fault. Repair as necessary. N.B. If replacing any components on the AM section, the set must be re-aligned
Record deck fails to operate mechanically.	Wire disconnected from power supply. Motor fault. Belt disconnected	Repair as necessary. Repair/replace as necessary.
Record deck operates mechanically but gives weak or distorted sound on both channels.	Stylus damaged. Stylus not located correctly in cartridge. Cartridge faulty.	Replace. Re-locate. Replace.
Record deck operates mechanically but gives no sound on either or one channel.	Cartridge faulty. Wiring between cartridge and amplifier section desconnected.	Replace
Record deck wow or flutter.	Belt slipping or stretched.	Clean, relocate or replace as necessary.
Record deck speed control inoperative.	Speed control IC faulty.	Check and replace as necessary
Cassette deck mechanism not turning.	Connecting plug between cassette section and main amplifier not locating Motor faulty. Drive belt not in position. Cassette jammed. General mechanical fault in cassette mechanism.	Re-locate. Check and replace as necessary. Re-position drive belt. Check for stretching of the belt and replace if necessary. Replace cassette. Check and repair as necessary
Cassette speed varies (wow and flutter).	Dirty or worn pinch roller assembly Drive belt in incorrect position. Motor faulty. General mechanical fault in cassette mechanism	Clean or replace as necessary. Re-position drive belt or replace if worn or stretched Check and replace as necessary. Check and repair as necessary.
Poor quality of recording or playback.	Dirty R/P Head. R/P Head picks up dust deposit almost constantly. R/P Head worn. Pin on connecting plug between cassette circuit and amplifier circuit not locating properly. General electronic fault on cassette.	Clean as necessary Head requires demagnetisation. Replace. N.B. Please refer to cassette re-alignment instructions Re-locate plug correctly. Check and repair as necessary.
When making new recordings, old recordings not erasing properly.	Faulty erase head. Wire disconnected from erase head. Faulty oscillator coil. (L3103).	Replace. Repair as necessary. Check and replace as necessary
VU LEDs not working correctly.	Faulty leads from main amplifier and cassette. LEDs faulty.	Check and repair as necessary. Replace and re-adjust.
Severe hum on one or both channels with volume at minimum.	Output IC faulty.	Check and replace.
Hum on one or both channels at high volume only.	General circuit fault.	Check and repair as necessary.
One channel not working.	Check speaker and speaker leads by reversal	Repair or replace as necessary.
One channel not working and blows fuse(s) 502 or 503.	Output IC faulty or cassette fault.	Check and replace as necessary.
Volume or tone controls crackling when operated.	Dirty or worn potentiometers	Spray with switchclean or replace if necessary.
Output LEDs not working correctly.	Faulty LEDs. Fault on LED PCB.	Replace as necessary. Check and repair as necessary.
Sound through headphones but not speakers, one or both channels.	Headphone socket faulty. Lead disconnected between 'phone socket and speaker socket. Speaker socket faulty.	Check and replace. Check and repair as necessary. Check and replace as necessary.
One speaker gives distorted sound.	Faulty speaker. Check by reversal of speakers. If reversal of speakers demonstrates fault in amplifier section, faulty power IC. If fault condition persists, general amplifier fault.	Repair and replace as necessary Check and replace. Check and repair as necessary

CABINET DRAWING



CABINET PARTS LIST

Sym	Description	Part No.
1	Glass Lid Trim	90090
2	Glass Lid	70001
3	BSR P281 Record Deck	S/83008
4	Tetrad Cartridge	83007/A
5	Dust Cover Hinge	90002
6	Plastic Screws	B3510
7	Tetrad Stylus	83007/B
8	Chassis Mounting Screw	91010
9	Screw Cap	92002/MD

Sym	Description	Part No.
10	Hinge Mounting Bracket	90003
11	Bracket Screw	91061
12	Magnet Screw	91116
13	Magnet Assembly	90015
14	Glass Door Hinge Kit	90001
15	Castor Assembly	90100
16	Cabinet	B3086
17	Speakers (Pairs)	LS37
18	Remote Control	800061
19	Glass Door	70002

ALIGNMENT INSTRUCTIONS

Equipment required: VTVM; AM/FM Band SSG; Loop Antenna; AM/FM IF Genoscope; Non Metallic Trimming Tool; Dummy Load; – 470K; Oscilloscope; Frequency Counter.

AM Alignment

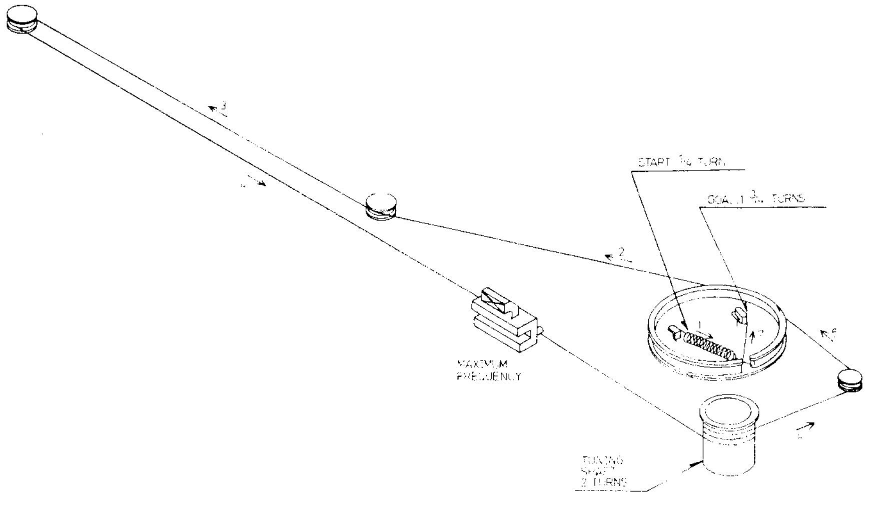
Step	FUNCTION	SIGNAL IN	SIGNAL OUT	METHOD	REMARKS
1.	AM IF Alignment at 468kHz.	Inject signal at L103 from AM IF SG. Select 468kHz AS IF.	Connect G'scope at TP3.	Adjust L107 and L105 to get max signal output on 'scope.	1. Ensure set switched to MW band. 2. Vol control max. Tone control at centre. 3. Sig. input optimum to avoid AGC action.
2.	REPEAT STEP 1 UNTIL NO FURTHER IMPROVEMENT IS OBSERVED.				
3.	MW Osc. Alignment at 525kHz.	Connect loop antenna to the ferrite rod. Inject signal from AM SSG at 525kHz.	Connect VTVM and O'scope across speaker output via dummy load.	Adjust L105 to obtain max sig. output on the meter and 'scope.	1. Ensure set tuned to 525kHz. 2. Vol control max. Tone control at centre. 3. Sig. input optimum to avoid AGC action.
4.	MW Osc. Alignment at 1650kHz.	Connect loop antenna to the ferrite rod. Inject signal from AM SSG at 1650kHz.	Connect VTVM and O'scope across speaker output via dummy load.	Adjust TC106 to obtain max sig output on the meter.	1. Ensure set tuned to 1650kHz. 2. Vol control max. Tone control at centre. 3. Sig. input optimum to avoid AGC action.
5.	REPEAT STEPS 3 & 4 UNTIL NO FURTHER IMPROVEMENT OBTAINED.				
6.	MW aerial alignment at 600kHz.	Connect loop ant. to the ferrite rod to inject sig from AM SSG at 600kHz.	Connect VTVM and O'scope across speaker output via dummy load.	Adjust L103 to obtain max sig. output on the meter and scope.	1. Ensure set tuned to 600kHz. 2. Vol control max. Tone control at centre. 3. Sig output optimum to avoid AGC action.
7.	MW aerial alignment at 1400kHz.	Connect loop ant. on the ferrite rod to inject sig from AM SSG at 1400kHz.	Connect VTVM and O'scope across speaker output via dummy load.	Adjust TC105 to obtain max sig output on the meter & scope.	1. Ensure set tuned to 1400kHz. 2. Vol control max. Tone control at centre. 3. Sig. input optimum to avoid AGC action.
8.	REPEAT STEPS 6 & 7 UNTIL NO FURTHER IMPROVEMENT.				
9.	LW Osc and aerial alignment at 140kHz.	Connect loop ant to ferrite rod. Inject 140kHz from AM SSG.	Connect VTVM and O'scope across speaker output via dummy load.	Adjust L104 and 103 to obtain max sig. output on the meter and scope.	1. Ensure set switched to LW. 2. Set tuned to 140kHz. 3. Vol control max. Tone control at centre. 4. Sig. input optimum to avoid AGC action.
10.	LW Osc alignment at 280kHz.	Connect loop ant to ferrite rod. Inject 280kHz from AM SSG.	Connect VTVM and O'scope across speaker output via dummy load.	Adjust TC104 and TC103 to obtain max sig output on the meter and scope.	1. Ensure set switched to LW. 2. Vol control max. Tone control at centre. 3. Sig. input optimum to avoid AGC action.
11.		REPEAT STEPS 9 & 10 UNTIL NO FURTHER IMPROVEMENT.			MW & LW alignment now complete. Ensure all the coils and transformers are sealed.

FM ALIGNMENT

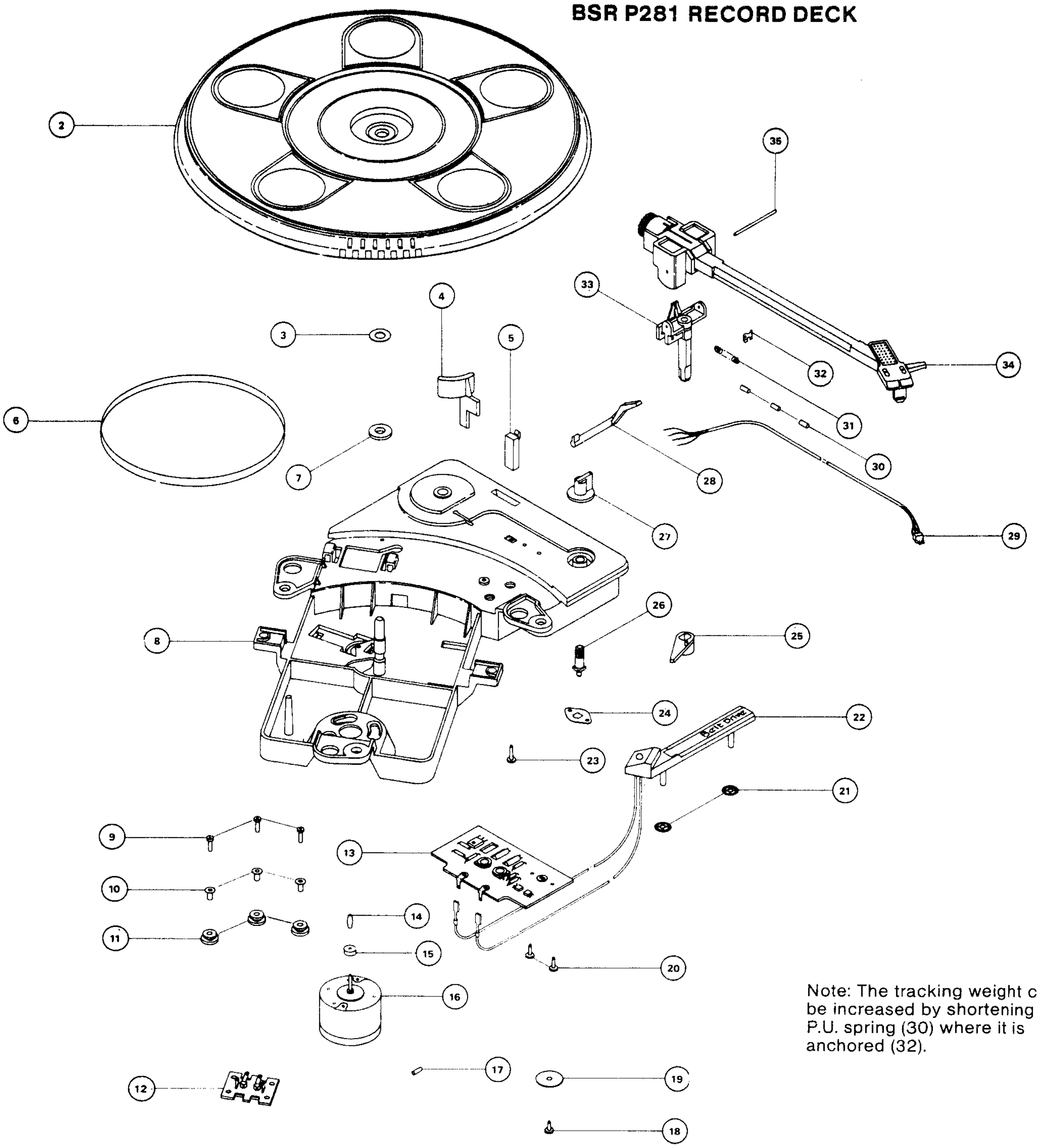
Step	FUNCTION	SIGNAL IN	SIGNAL OUT	METHOD	REMARKS
1.	FM IF alignment at 10.7MHz.	Inject 10.7MHz signal from FM IF SSG at TP1.	Connect O'scope to TP3.	Adjust L102 to obtain max output on the scope with a symmetrical 'S' curve centered at 10.7MHz.	1. Set switched to FM. 2. Ensure stereo/mono sw. switched to mono. 3. Sig. input optimum to avoid AGC action.
2.	FM IF alignment at 10.7MHz.	Inject 10.7MHz signal from FM IF SSG at TP1.	Connect O'scope to TP3.	Adjust L108 to obtain symmetrical 'S' curve.	1. Ensure set switched to FM. 2. Ensure stereo/mono sw. switched to mono. 3. Sig. input optimum to avoid AGC action.
3.	REPEAT STEPS 1 & 2 UNTIL NO FURTHER IMPROVEMENT				
4.	FO Osc alignment at 86.5MHz.	Inject 86.5MHz signal from FM IF SSG at J101.	Connect scope & VTVM across dummy load.	Adjust L102 to obtain max output on the meter.	1. Ensure set tuned to 86.5MHz. 2. Ensure stereo/mono sw. switched to mono. 3. Sig. input optimum to avoid AGC action.
5.	FM Osc alignment at 109MHz.	Inject 109.5MHz signal from FM IF SSG at J101.	Connect scope & VTVM across dummy load.	Adjust TC102 to obtain max output on the meter.	1. Ensure set tuned to 109.5MHz. 2. Ensure stereo/mono sw. switched to mono. 3. Sig. input optimum to avoid AGC action.
6.	REPEAT STEPS 4 & 5 UNTIL NO FURTHER IMPROVEMENT.				
6.	FM Osc tracking at 90MHz.	Inject 90MHz signal from FM IF SSG at J101.	Connect scope & VTVM across dummy load.	Adjust L101 to obtain max output on the meter.	1. Ensure set tuned to 90MHz, vol max. 2. Tone control to centre. 3. Sig. input optimum to avoid AGC action.
8.	FM Osc tracking at 106MHz.	Inject 106MHz signal from FM IF SSG at J101.	Connect scope and VTVM across dummy load.	Adjust TC101 to obtain max output on the meter.	1. Ensure set tuned to 106MHz, vol max. 2. Tone control to centre. 3. Sig. input optimum to avoid AGC action.
9.	REPEAT STEPS 7 & 8 UNTIL NO FURTHER IMPROVEMENT.				
10.	FM MXP adjustment.	Set tuned to a strong stereo station.	Frequency counter at TP5.	Adjust VR201 to get the stereo beacon on & to read 19kHz on frequency counter.	1. Ensure set switched to FM. 2. Ensure stereo/mono sw. to stereo. FM alignment now complete.

FM SEPARATION ADJUSTMENT

Step	FUNCTION	SIGNAL IN	SIGNAL OUT	METHOD	REMARKS
1.	FM SG to 98MHz.	Inject 98MHz from FM SSG at J101.	Listen to the speakers.	Adjust VR202 to obtain proper separation.	1. Set the FM SSG to 98MHz. 60dB, 65.7k deviation. 2. Tone control mid position. 3. Loudness, rumble controls off. 4. stereo/mono sw. to stereo.



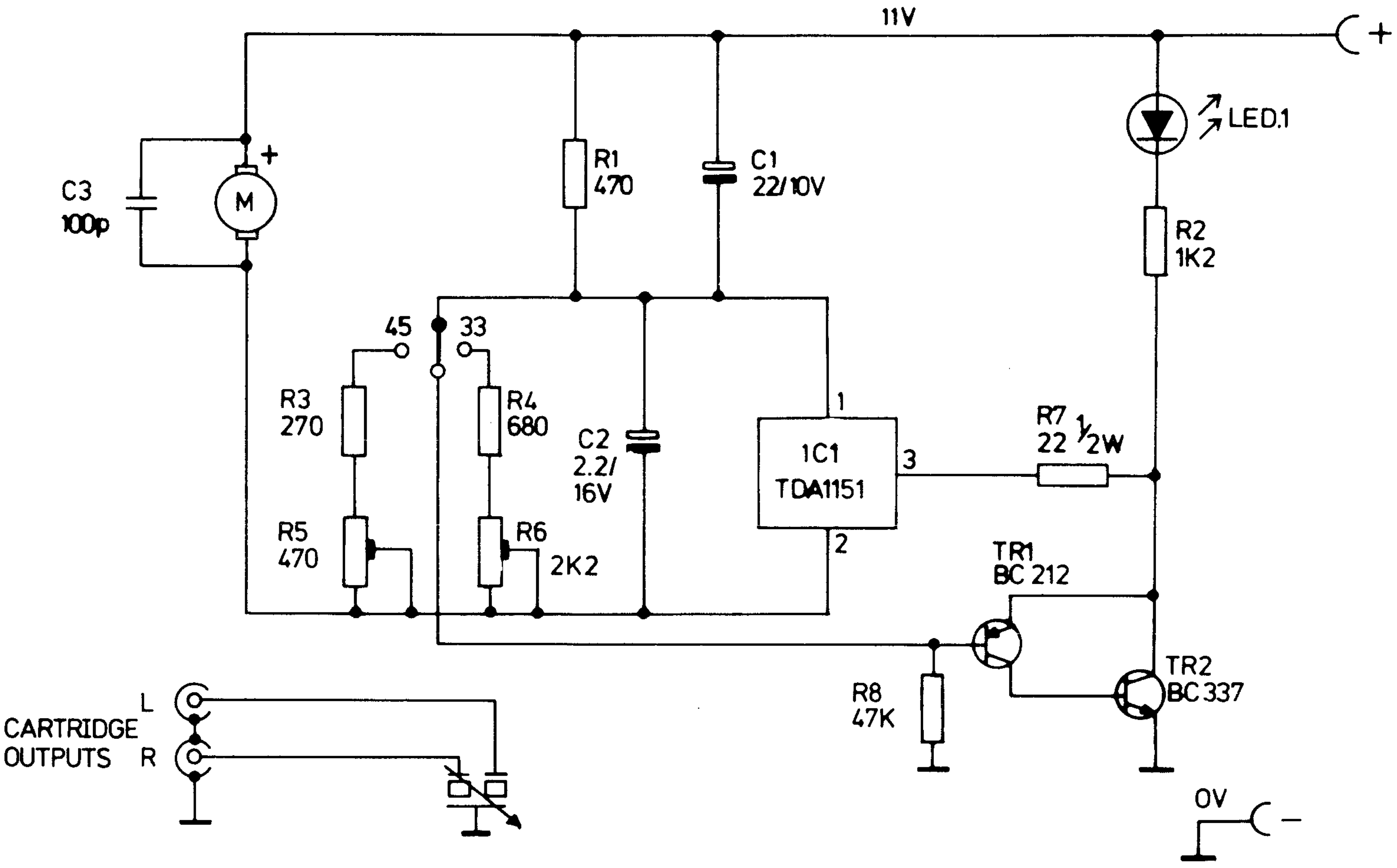
BSR P281 RECORD DECK



Note: The tracking weight can be increased by shortening the P.U. spring (30) where it is anchored (32).

Item	Part No.	Description	Item	Part No.	Description
1	A102110	Circlip	19	A105660	Control Washer
2	A117931	Turntable Assembly	20	A105267	Screw Type B.T.4-24 x 8 Rec.PanHd.(2 off)
3	A114621	Thrust Washer	21	A102251	Retaining Clip (2 off)
4	B117826	Raising Pad	22	A117994	Escutcheon Assembly
5	B117831	Pick Up Rest	23	A106511	Screw Type B.T.4-24 x 12 Rec.Pan Hd.
6	A114446	Drive Belt	24	A116564	Detent Spring
7	A117703	Spacer	25	A117829	P.U. Hinge Retainer
8	C117952	Unit Plate Assembly	26	A116565	Knob Spindle
9	A117660	Screw (3 off)	27	B117824	Control Knob
10	A117950	Spacing Bush (3 off)	28	B117828	Cue Lever
11	A117680	Grommet (3 off)	29	A117510	Quad P.U. Lead Assembly
12	A102616	Phono Socket (Bridged)	30	A103373	Securing Rubber (3 off)
13	A300196	On/off Speed Control Board Final Assembly	31		P.U. Balance Spring
14	A116570	Drive Sleeve	32	A105142	Spring Anchor
15	A117650	Drive Sleeve Flange	33	C117830	Pick-Up Hinge
16	B116574	D.C. Motor Requirements	34	D117823	Pick-Up Arm
17	A103373	Securing Rubber	35	A117840	Pivot Pin
18	A106510	Screw Type B No.6 x 6.5 Rec. Pan Hd.			

P281 CIRCUIT DIAGRAM AND PARTS LIST


11V
+
LED.1
R1
470
C1
22/10V
C3
100p
M
+
R2
1K2
45
33
R3
270
R4
680
C2
2.2/
16V
1
1C1
TDA1151
3
R7
22 ½W
2
R5
470
R6
2K2
TR1
BC 212
TR2
BC337
R8
47K
L
CARTRIDGE
OUTPUTS
R
0V
−

ELECTRICAL PARTS LIST BSR P281

Circ Ref	Description	Part No.
Resistors (¼W/±5%)		
R1	470ohm	10048
R2	1K2ohm	10065
R3	270ohm	10042
R4	680ohm	10052
R8	47Kohm	10101
Resistors (½W/±5%)		
R7	22ohm	10039
Preset Resistors		
R5	470ohm	300329
R6	2K2ohm	300330
Capacitors		
C1	22mf/10V Electrolytic	20011
C2	2.2mfd/16V Electrolytic	20021
C3	100pF Ceramic	20416
Transistors		
TR1	BC212	50009
TR2	BC337/25	50002
IC		
IC1	TDA1151	806204

Note:-
Preset resistors R5 (45RPM) and R6 (33RPM) are for fine speed control adjustments.

On the P281 record deck, they can be adjusted from the top of the deck through 2 small holes on the unit plate assembly near the safety selector control.

R6 (33RPM) is closer to the front of the turntable.

Information on Record Deck
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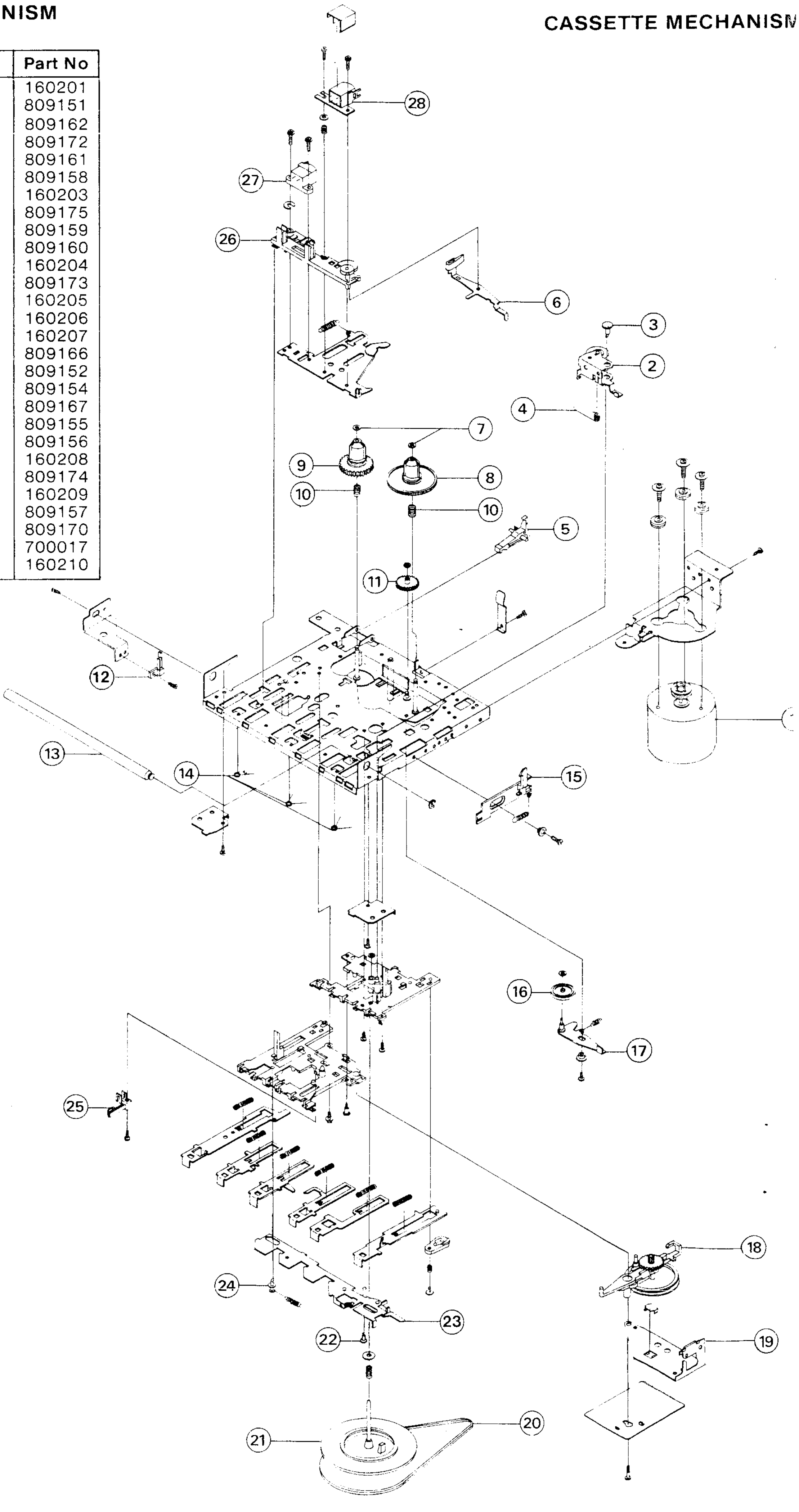
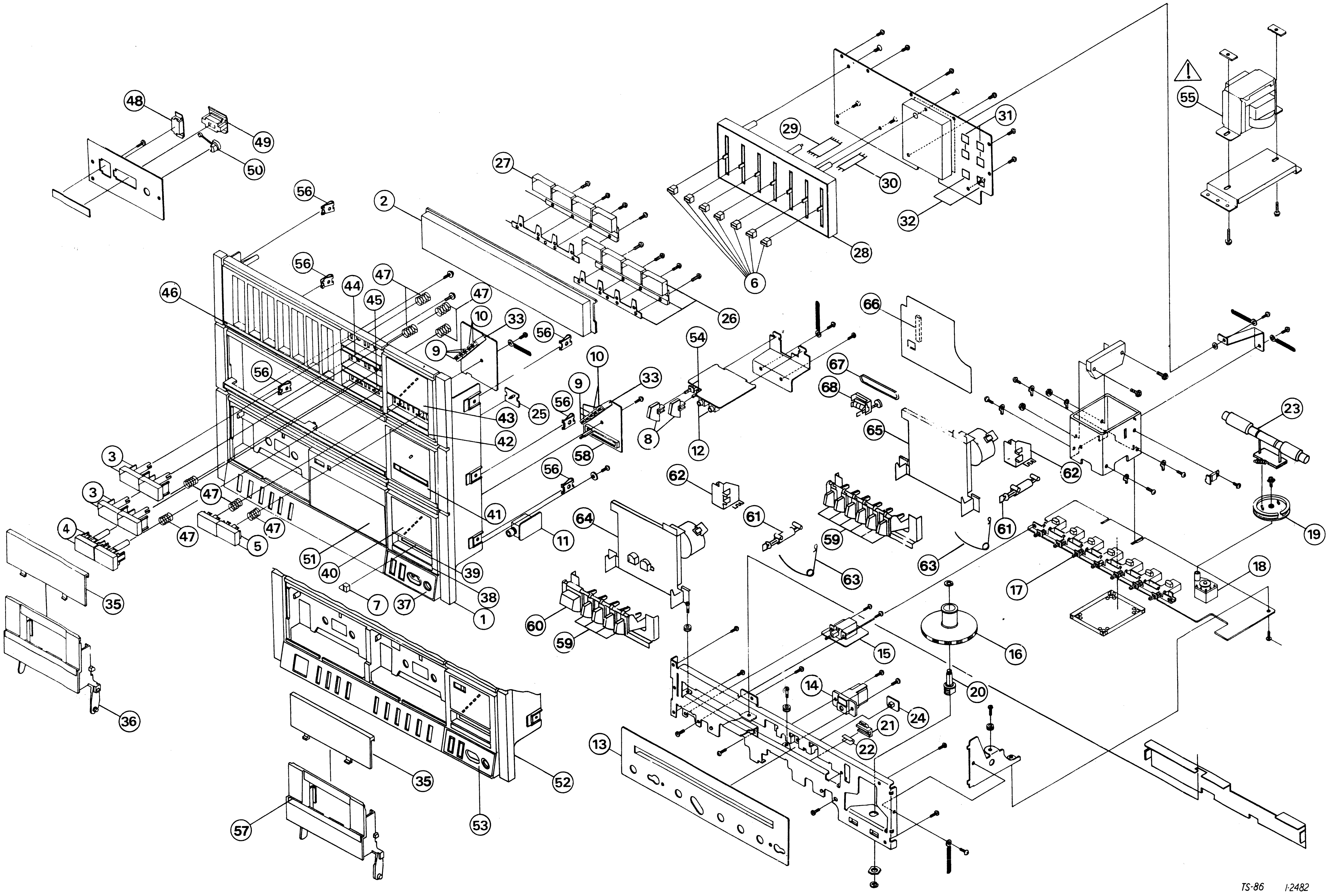
CASSETTE MECHANISM PARTS LIST

Sym	Description	Part No
1	Cassette Motor TS87	160201
1	Cassette Motor TS86	809151
2	Pinch Roller Assy	809162
3	Stopper Locking Plate	809172
4	Spring Pinch Roller	809161
5	Record Safety Lever	809158
6	Auto Stop Arm	160203
7	Poly Washer	809175
8	Take Up Spool Assy	809159
9	Rewind Spool Assy	809160
10	Spring Spool	160204
11	F.F. Gear	809173
12	Leaf Switch	160205
14	Spring Key	160206
15	Eject Lever	160207
16	F.F./Rew Idler	809166
17	Idler Arm Assy	809152
18	Idler Gear Assy	809154
19	Flywheel Bracket	809167
20	Mainbelt	809155
21	Flywheel	809156
22	Stopper	160208
23	Locking Plate	809174
24	Stopper Spring	160209
25	Leaf Switch	809157
26	Head Base	809170
27	Erase Head	700017
28	R/P Head	160210

CASSETTE MECHANISM



CHASSIS DRAWING

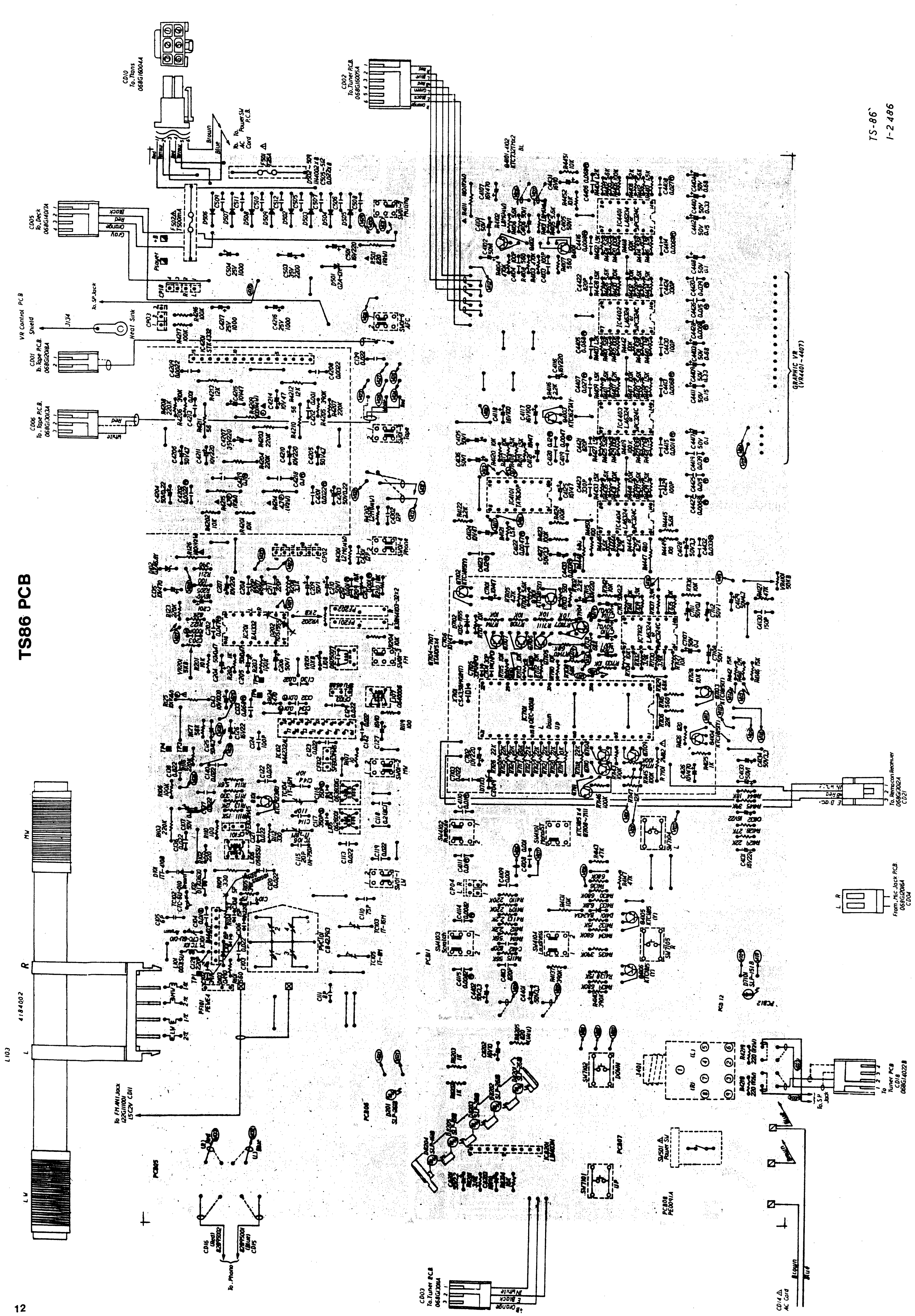


CHASSIS PARTS LIST

Sym	Description	Part No.
1	Front Panel TS86	130001
2	Dial Lens	130002
3	Mode Button	130003
4	Balance Button	130004
5	Volume Button	130005
6	Tone Control Button	130006
7	Record Level Button	130007
8	Tape Function Button	130008
9	LED Green	130050
10	LED Red	130051
11	Headphone Socket	130009
12	Mic. Socket	130010
13	Tuning Dial	130011
14	P.P.M. Sensor	800036
15	Power On/Off Switch	130012
16	Tuning Knob	130013
17	Function Switch Bank	130014
18	Tuning P.V.C.	130015
19	Tuning Drum	130016
20	Tuning Shaft	130017
21	Tuning Pointer	130018
22	Pointing Paper	130019
23	Ferrite Rod Assembly	130020
24	LED Stereo Indicator	130050
25	LED P.P.M. Indicator	130052
26	Function Button (Right) Assy.	130021
27	Function Button (Left) Assy.	130022
28	Tone Control Pot. Bank	130023
29	14 Way Flex.	130024
30	4 Way Flex.	130025
31	Mode Switch	130026
32	Balance Tact Switch	130027
33	LED Spacer	130028
34	Lens Cassette 1	130029
35	Lens Cassette 2	130030
36	Cassette Door (with Amstrad printed)	130031
37	Mic. Label TS86	130032
38	Record Level Label	130033
39	Record Level Graduation Label	130034
40	VU Label	130035
41	Tuning Label	130036
42	Volume Label	130037
43	Power Label	130038
44	Rumble/Scratch Label	130039
45	Mode/Loudness Label	130040
46	Graphic Eq./Bal. Label	130041
47	Spring Button	130042
48	Aerial Socket	90042
49	Speaker Socket	250012
50	Cable Restraint	S/25011
51	Label Decoration	130043
52	Front Panel TS87	130044
53	Mic. Label TS87	130045
54	Switch Tape Function	130046
55	Mains Tx.	130047
56	Chassis Retaining Nut	810013
7	Cassette Door	130048
58	Record Level Control	130049
59	Cassette Key	130061
60	Cassette Kay Play Only	130062
61	Air Damper	130066
62	Damper Bracket	130068
63	Spring Damper	130067
64	Cassette Mechanism B TS87	130064
65	Cassette Mechanism A TS87	130063
65	Cassette Mechanism TS86	130065
66	Record Play Switch	400134
67	Counter Belt	130070
68	Counter	130069

Note: All parts shown with either the safety symbol ⚠ or with an 'S' prefix on the part numbers; are safety critical items and must be replaced with items having an identical safety specification.
All these items may be purchased direct from:
AMSTRAD CONSUMER ELECTRONICS PLC.

TS86 PCB



TS-86
1-2486

CASSETTE ALIGNMENT INSTRUCTIONS

Equipment required: Double Beam Oscilloscope; Frequency Counter; RMS Meter; Non Metallic Trimming Tool; 6.8kHz Test Tape; 1kHz Test Tape.

Step	FUNCTION	SIGNAL IN	SIGNAL OUT	REMARKS	REMARKS
1.	Bias frequency adjustment.	Switch SW3101 to record.	Monitor 'scope or frequency counter from junction C3135 & C3130.	Adjust L3103 to give 62.5kHz.	Ensure the AFC switch is off.
2.	Bias level adjustment.	Switch SW3103 to record.	RMS Meter across R301/302 in turn.	Adjust VR3101 & 3102 to show 10mV.	Ensure AFC switch is off.
3.	Head azimuth adjustment.	6.8kHz Test tape.	Double beam 'scope at speaker sockets.	Adjust azimuth screw for max amplitude on both channels ensuring both signals in phase.	Ensure set switched to tape.
4.	Tape speed adjustment.	1kHz Test tape.	Frequency counter at speaker socket.	Adjust motor with non-metallic trimming tool for correct frequency.	Ensure set switched to tape.

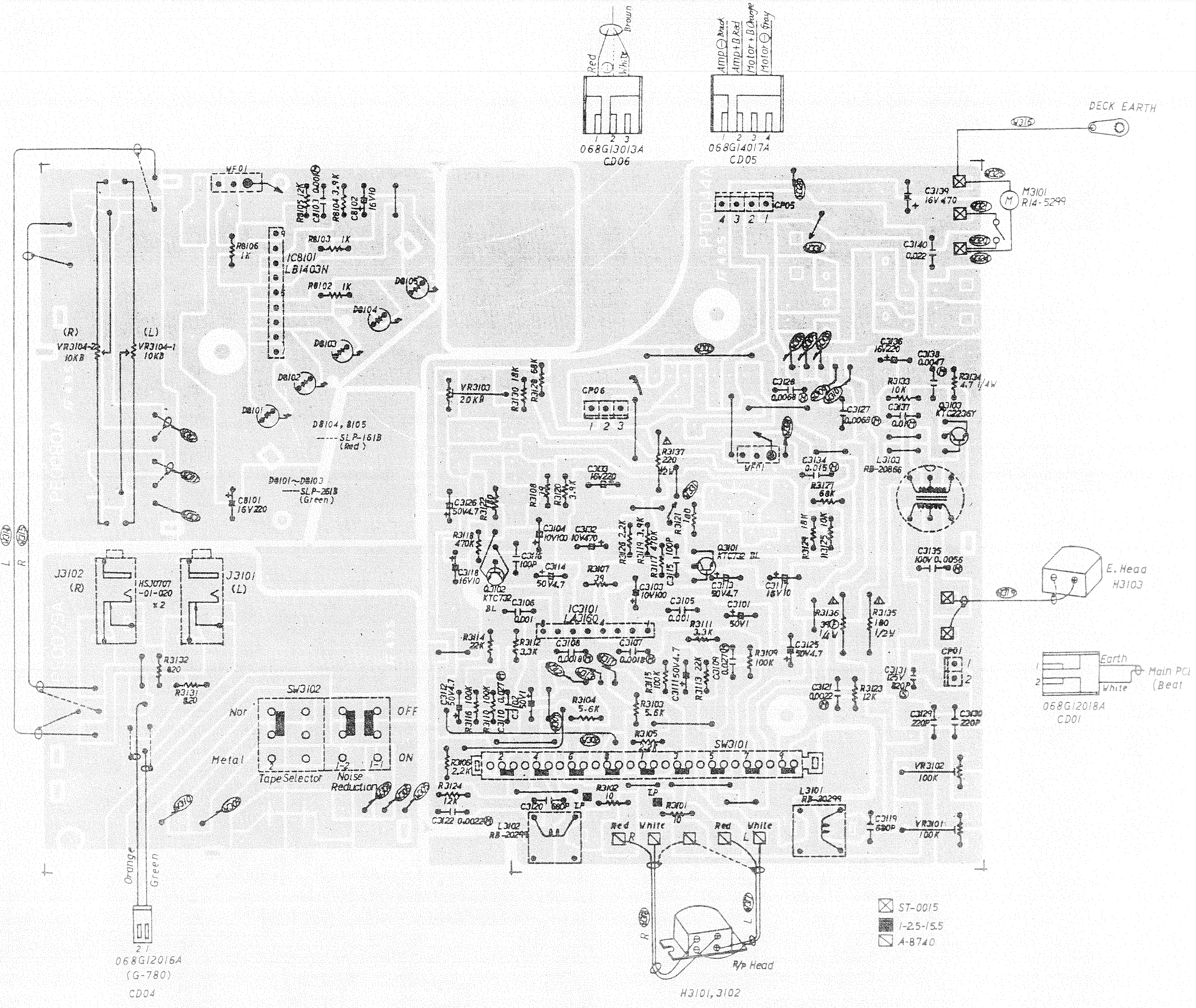
CASSETTE DECK MECHANISM – GENERAL MAINTENANCE

Before attempting any specific fault-finding on the cassette mechanisms, it is recommended that the following checks and maintenance procedures be carried out.

1. **R/P HEAD** (Symbol 28)
   Thoroughly clean the head and examine for signs of wear; replace if worn; de-magnetise.
2. **PINCH-ROLLER ASSEMBLY** (Symbol 2)
   Thoroughly clean, check general condition. If rubber roller is in any way distorted, replace the assembly. Check the tension of the Pinch-Roller Spring, the tension should be 40 to gm.
3. **MAIN BELT** (Symbol 20)
   Ensure the belt is correctly located. Check that it is not stretched or worn and replace if necessary. In any event, remove the belt and clean with methylated spirits.
4. **TAKE-UP SPOOL ASSEMBLY** (Symbol 8)
   Check the tension of this using a cassette torque meter. The correct reading should be 40gm per cm. A reading of between 30 and 50gm per cm may be regarded as within tolerance. Should the reading fall below 30gm per cm, it must be adjusted to give the correct torque. If it cannot be adjusted it should then be replaced.
5. **REWIND IDLER ASSEMBLY** (Symbol 9)
   Check the tension with the cassette torque meter using the rewind function. The torque should be 100gm per cm but a reading of between 80 and 110 gm per cm may be considered within tolerance. If the torque falls below 80gm per cm, it should be adjusted to give the correct reading. If it will not adjust sufficiently, it should be replaced.
6. **MOTOR** (Symbol 1)
   Ensure that the motor is securely mounted and that the motor rubbers are in good condition.
7. **FLY-WHEEL** (Symbol 21)
   Check that the Fly-wheel spindle is not worn or bent and that it is securely seated in its bearing.
8. **INTERNAL MECHANISM**
   After prolonged use, the internal mechanism will normally contain substantial deposits of oxide dust. Ensure that these are thoroughly cleaned.

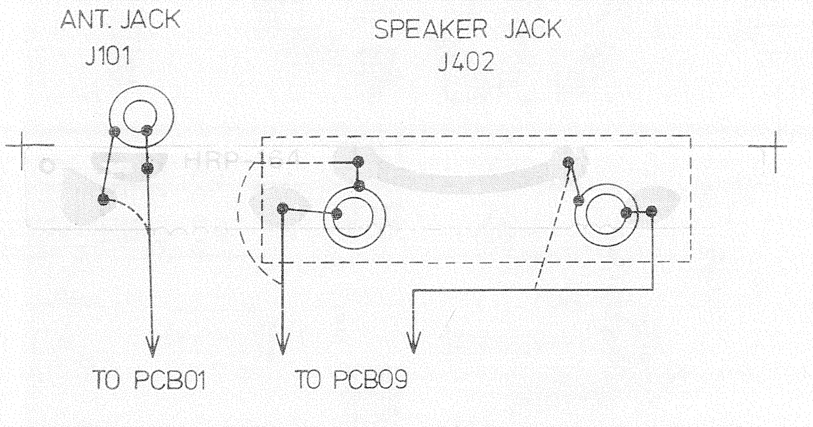
There are no places on either mechanism which require any oil or grease and the application of any such lubrication is likely to seriously harm the internal workings of the mechanism.

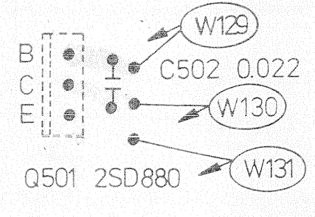
TS86 CASSETTE PCB


From Main P.C.B.
Red
White
Brown
068G13013A
CD06
From Main P.C.B.
Amp ⊖ Black
Amp + B Red
Motor + B Orange
Motor ⊖ Gray
068G14017A
CD05
DECK EARTH
W315
C3139 16V 470
M3101 R14-5299
C3140 0.022
WF01
R8105 1.2K
C8101 0.001
R8104 3.9K
C8102 16V10
R8106 1K
R8103 1K
R8102 1K
IC8101 LB1403N
D8105
D8104
D8103
D8102
D8101
D8104, 8105 ----SLP-161B (Red)
D8101~D8103 ----SLP-261B (Green)
C8101 16V220
CP05 4 3 2 1
(R) VR3104-2 10KB
(L) VR3104-1 10KB
VR3103 20KB
R3130 18K
R3128 68K
CP06 1 2 3
C3136 16V220
C3138 0.0047
R3134 4.7 1/4W
C3128 0.0068
C3127 0.0068
R3133 10K
C3137 0.0X
Q3103 KTC2236Y
L3103 RB-20866
C3134 0.015
R3127 68K
R3137 220 1/2W
C3133 16V220
C3126 50V4.7
R3122
R3108
R3120 3.9K
R3126 2.2K
R3119 3.9K
R3117 470K
C3104 10V100
C3132 10V470
R3121 100
Q3101 KTC732 BL
R3129 18K
R3125 10K
C3135 100V 0.0056
E. Head H3103
R3118 470K
C3116 100P
C3118 16V10
Q3102 KTC732 BL
C3114 50V4.7
R3107 39
C3103 10V100
C3115
C3113 50V4.7
C3111 16V10
C3106 0.001
C3105 0.001
C3101 50V1
R3136 39 1/4W
R3135 180 1/2W
J3102 (R)
HSJ0707-01-020 ×2
J3101 (L)
IC3101 LA3160
R3114 22K
R3112 3.3K
C3108 0.0018
C3107 0.0018
R3111 3.3K
R3109 100K
C3125 50V4.7
CP01 1 2
Earth
White
Main PCB (Beat
068G12018A
CD01
R3132 820
R3131 820
SW3102
Nor
Metal
OFF
ON
Tape Selector
Noise Reduction
C3112 50V4.7
R3116 100K
R3110 100K
C3110 0.027
C3102 50V1
R3104 5.6K
R3115
R3103 5.6K
C3111 50V4.7
R3113 22K
C3109 0.027
C3121 0.0022
R3123 12K
C3131 125V 820P
C3129 220P
C3130 220P
R3105
SW3101
R3106 2.2K
R3124 12K
C3122 0.0022
C3120 680P
R3102 10
R3101 10
L3102 RB-20299
L3101 RB-20299
C3119 680P
VR3102 100K
VR3101 100K
Red R
White
Red
White L
Orange
Green
068G12016A (G-780)
CD04
L
R
R/P Head
H3101, 3102
ST-0015
1-2.5-15.5
A-8740

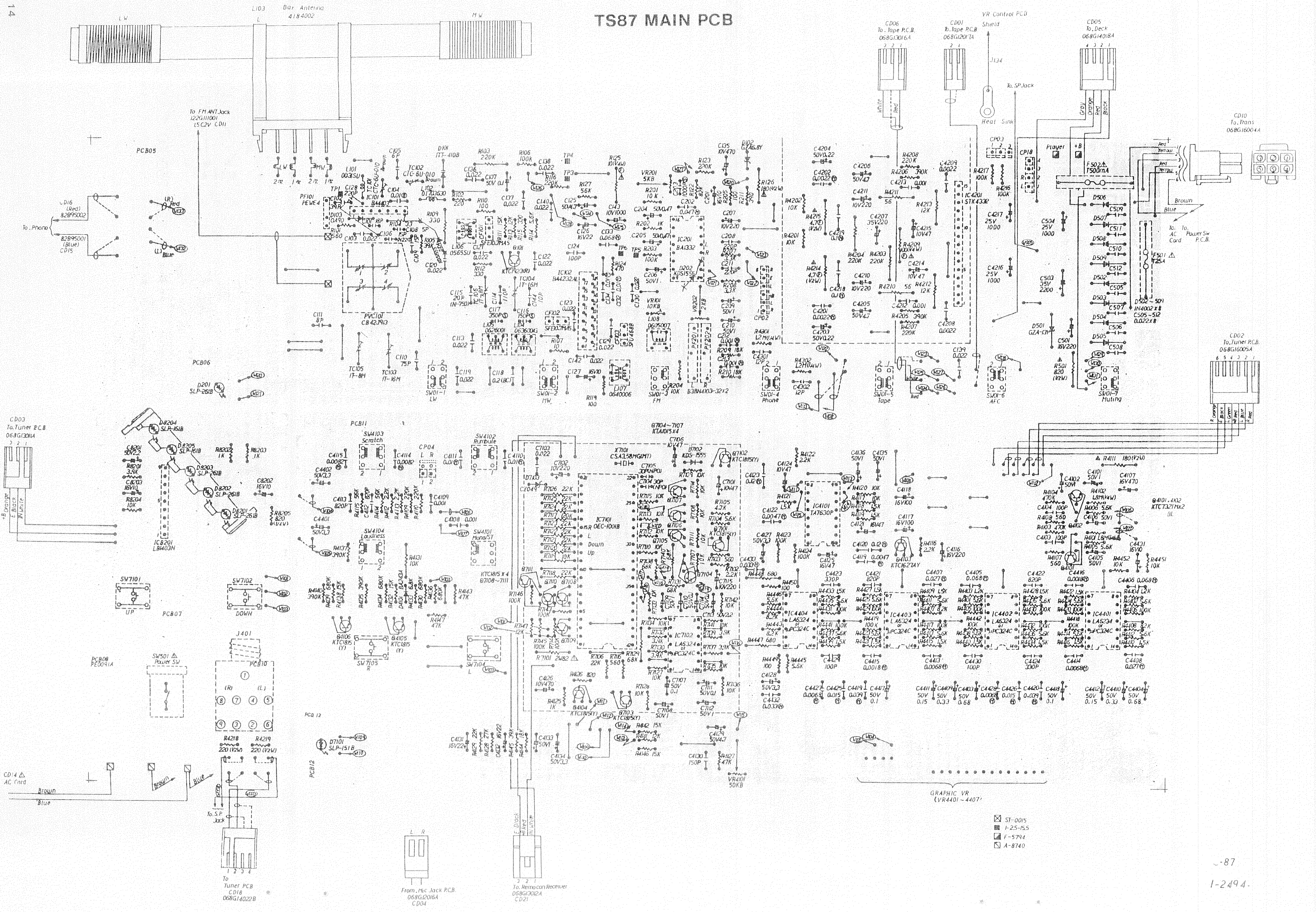
2-2296

TS-86


ANT. JACK
J101
SPEAKER JACK
J402
HRP-1
TO PCB01
TO PCB09


B
C
E
W129
C502 0.022
W130
W131
Q501 2SD880

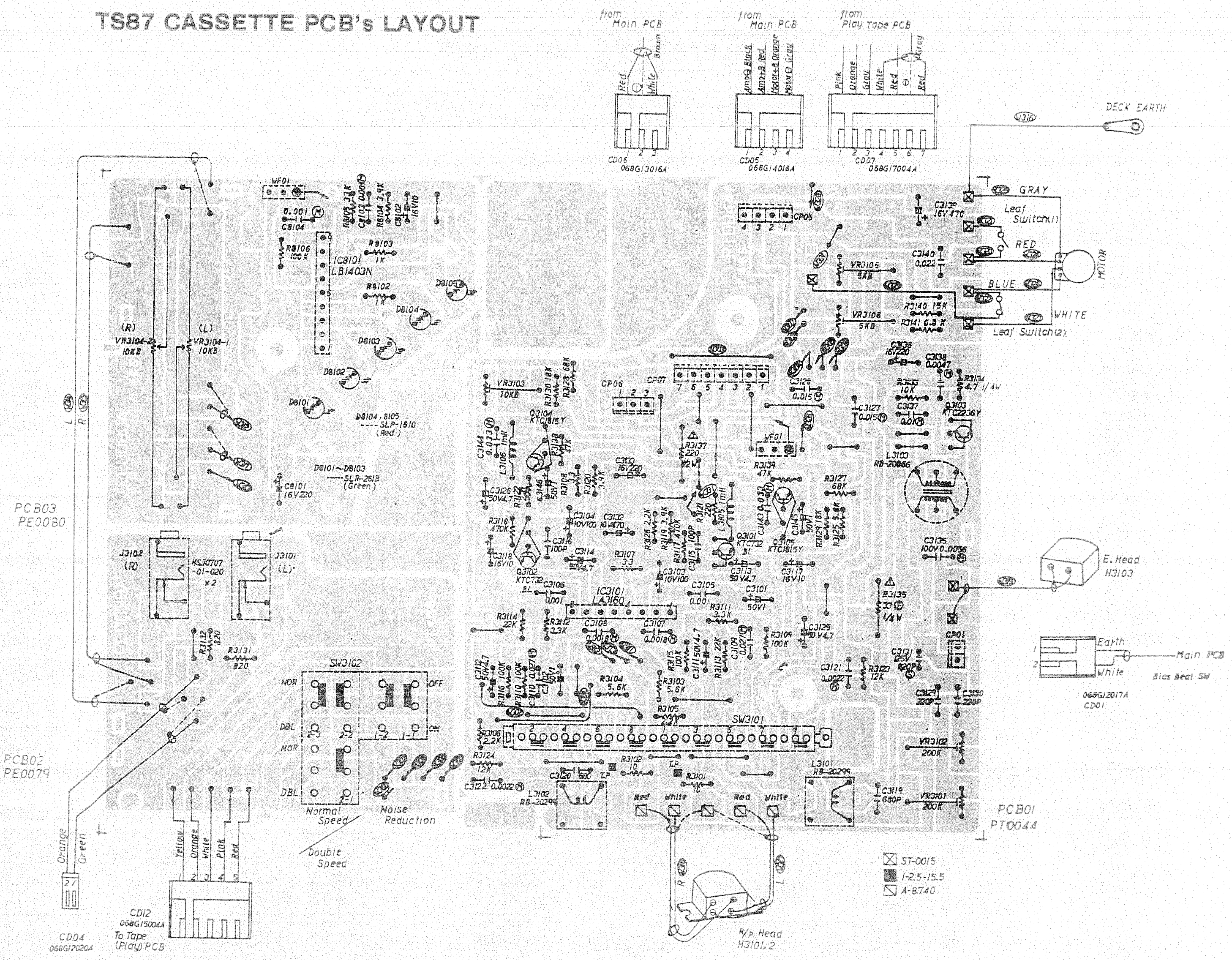
TS87 MAIN PCB


L103
Bar Antenna
4184002
LW
MW
To FM ANT Jack
122G111001
LSC2V CD11
PCB05
CD16
(Red)
82B95002
82B95001
(Blue)
CD15
To Phono
PCB06
D201
SLP-261B
CD03
To Tuner PCB
068G13014A
+B Orange
E Black
IN White
PCB11
SW4103
Scratch
SW4102
Rumble
SW4104
Loudness
SW4101
Mono/ST
CP04
SW7101
UP
SW7102
DOWN
PCB07
PCB08
PE0091A
SW501 ⚠
Power SW
J401
PCB10
PCB12
D7101
SLP-151B
SW7105
R
SW7104
L
CD14 ⚠
AC Cord
Brown
Blue
To S.P. Jack
To Tuner PCB
CD18
068G14022B
From Mic Jack P.C.B.
068G12016A
CD04
To Remocon Receiver
068G13012A
CD21
IC101
BA4402
PVC101
CB42J9I3
IC201
BA1332
ICK02
BA4232AL
SW01-1
LW
SW01-2
MW
SW01-3
FM
SW01-4
Phone
SW01-5
Tape
SW01-6
AFC
SW01-7
Muting
IC4201
STK4332
IC7101
DEC-1001B
IC7102
LA6324
IC4101
TA7630P
IC4401
IC4402
IC4403
IC4404
LA6324
IC8201
LB1403N
CD06
To Tape P.C.B.
068G13016A
CD01
To Tape P.C.B.
068G12017A
VR Control PCB
Shield
J134
Heat Sink
To SP Jack
CP03
CP18
Player
+B
CD05
To Deck
068G14018A
Gray
Orange
Red
Black
CD10
To Trans
068G16004A
F502 ⚠
T500mA
F501 ⚠
T2A
D502 ~ 509
1N4002 x 8
C505 ~ 512
0.022 x 8
To AC Cord
To Power Sw P.C.B.
CD02
To Tuner P.C.B.
068G16005A
GRAPHIC VR
(VR4401 ~ 4407)
☒ ST-0015
■ 1-25-15.5
◩ F-5794
▧ A-8740

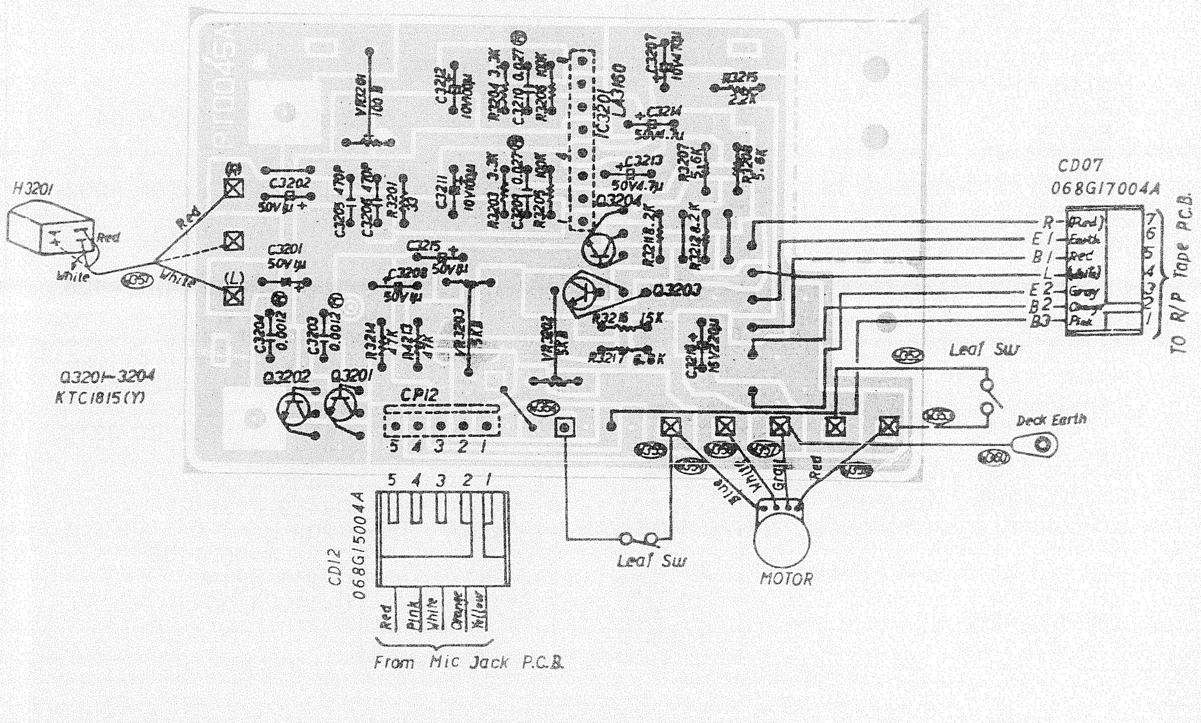
-87

1-2494-

TS87 CASSETTE PCB's LAYOUT


from Main PCB
Red
White
Brown
CD06 068G13016A
from Main PCB
Amp(L) Black
Amp(R) Red
Motor(+) Orange
Motor(-) Gray
CD05 068G14016A
from Play Tape PCB
Pink
Orange
Gray
White
Red
Red
Gray
CD07 068G17004A
DECK EARTH
GRAY
Leaf Switch(1)
RED
BLUE
WHITE
Leaf Switch(2)
MOTOR
C3139 16V470
C3140 0.022
VR3105 5KB
VR3106 5KB
R3140 15K
R3141 6.8K
CP05
WF01
C8104 0.001
R8106 100K
IC8101 LB1403N
R8103 1K
R8102 1K
D8101
D8102
D8103
D8104
D8105
D8104, 8105 SLP-151G (Red)
D8101~D8103 SLR-26IB (Green)
C8101 16V220
(R) VR3104-2 10KB
(L) VR3104-1 10KB
L
R
PCB03 PE0080
J3102 (R)
HS30707-01-020 x2
J3101 (L)
R3132 820
R3131 820
PCB02 PE0079
SW3102
NOR
OFF
DBL
ON
Normal Speed
Noise Reduction
Double Speed
Orange
Green
CD04 068G12020A
Yellow
Orange
White
Pink
Red
CD12 068G15004A
To Tape (Play) PCB
VR3103 10KB
CP06
CP07
Q3104 KTC1815Y
IC3101 LA3160
Q3101 KTC732 BL
Q3102 KTC732 BL
Q3105 KTC1815Y
Q3103 KTC2236Y
L3103 RB-20066
C3135 100V 0.0056
R3135 33 1/4W
E. Head H3103
CP01
Earth
White
Main PCB
Bias Beat SW
068G12017A CD01
SW3101
VR3102 200K
VR3101 200K
L3101 RB-20299
L3102 RB-20299
C3119 680P
C3122 0.0022
Red
White
Red
White
PCB01 PT0044
R
L
R/P Head H3101, 2
ST-0015
1-2.5-15.5
A-B740

TS-39 2-2306


H3201
Red
White
White
Red
C3202 50V1μ
C3201 50V1μ
C3205 470P
C3206 470P
R3201 33
C3211 10V100μ
C3212 10V100μ
VR3201 100B
IC3201 LA3160
C3207 10V470μ
R3215 2.2K
C3214 50V4.7μ
C3213 50V4.7μ
R3207 5.6K
R3208 5.6K
Q3204
Q3203
Q3202
Q3201
R3216 15K
R3217 6.8K
VR3202 5KB
VR3203 5KB
R3214 47K
R3213 47K
C3204 0.0012
C3203 0.0012
C3208 50V1μ
C3215 50V1μ
Q3201~3204 KTC1815(Y)
CP12
5 4 3 2 1
CD07 068G17004A
R (Red)
E1 (Earth)
B1 (Red)
L (White)
E2 (Gray)
B2 (Orange)
B3 (Pink)
7 6 5 4 3 2 1
TO R/P Tape P.C.B.
Leaf SW
Deck Earth
Blue
White
Gray
Red
MOTOR
Leaf SW
CD12 068G15004A
Red
Pink
White
Orange
Yellow
From Mic Jack P.C.B.

ELECTRICAL PARTS LIST

All the components are common to the TS86/87.
The bracketed components are only for the TS86.

Value	Circuit Reference	Part No.
Carbon Film Resistors (all ¼W)		
4.7ohm	R3134	10004
10ohm	R107, 3101, 3102	10008
33ohm	R104, 3107, 3108, 3201	10018
47ohm	R3138, 3139	10020
56ohm	R4210, 4211	809247
100ohm	R110, 119, 205, 4449, 4450	10032
180ohm	R126, (3121, 3122)	10038
220ohm	R102, 3121, 3122	10040
330ohm	R109, 112, 115	10044
390ohm	R211	10046
470ohm	R124, (4103, 4104)	10048
560ohm	R101, 4107, 4108, 7103, 7116,	10050
680ohm	R4447, 4448	10052
820ohm	R3131, 3132, 4126, 8205	10054
1kohm	R202, 4125, 8102, 8103, (8106), 8202, 8203	10061
1k2ohm	R4403, 4404	10063
1k5ohm	R4118, 4119, 4121, 4409, 4410, 4415, 4416, 4421, 4422, 4427, 4428, 4433, 4434, 4439, 4440	10065
2k2ohm	R3105, 3106, 3126, 3215, 4112, 4113, 4116, 4122, 7102	10069
3k3ohm	R207, 208, 3111, 3112, 3203, 3204	10073
3k9ohm	R3119, 3120, 7130, 7132, 7137, 7139, 8104, 8201	10075
4k7ohm	R7105	10077
5k6ohm	R114, 3103, 3104, 3125, 3207, 3208, 4105, 4106, 4401, 4402, 4411-4414, 4423-4426, 4435-4438, 4445, (4446, 7104)	10079
6k8ohm	R3141, 3217, 4133	10081
8k2ohm	R3211, 3212, 4443, 4444	10083
10kohm	R201, 204, 3133, 4117, 4120, 4131, 4132, 4201, 4202, 4451, 4452, 7107-7115, 7119, 7127, 7128, 7133-7136, 7141, 7142, 8204, (3125)	10085
12kohm	R113, 3123, 3124, 4141, 4214, 4213, 7147, (8105)	10087
15kohm	R111, 3140, 3216, 4132, 4138, 4142, 4146	10089
18kohm	R209, 210, 3129, 3130, 4144	10091
22kohm	R3113, 3114, 4129, 7106, 7118, 7120-7126	10093
27kohm	R4128	10095
33kohm	R8105	10097
39kohm	R105, 4145	10099
47kohm	R3213, 3214, 4127, 4143, 4147	10101
56kohm	R127, 4114, 4115	10103
68kohm	R3127, 3128, 7129, 7131, 7138, 7140, (4134, 4136, 4139)	10105
82kohm	R122, 4407, 4408	10107
100kohm	R106, 203, 3109, 3110, 3115, 3116, 3205, 3206, 4123, 4124, 4216, 4217, 4405, 4406, 4417-4420, 4429-4432, 4441, 4442, 7143-7146, 8106	10109
120kohm	R7117	10111
220kohm	R103, 116, 127, 4109, 4110, 4203, 4204, 4207, 4208 (123)	10117
390kohm	R4135, 4137, 4140, 4205, 4206	10123
470kohm	R3117, 3118, 4103, 4104	10125
680kohm	R4130	10129
1M2ohm	R4301, 4302	10148
1M8ohm	R4101, 4102	10150

Value	Circuit Reference	Part No.
Carbon Film Resistors (all ½W)		
180ohm	R4111, (126, 3135)	800203
220ohm	R3137, 4218, 4219	300202
820ohm	R501	800205
Fuse Resistors		
10ohm/¼W	R125	809256
100ohm/¼W	R4209	130101
380ohm/¼W	R3135	1400340
4.7ohm/½W	R4215	800206
Cement Resistor		
82ohm/2W	R7101	130102
Ceramic Capacitors		
5pF	C108	400104
6pF	C105	809249
8pF	C111	400105
10pF	C144	24001
12pF	C4301, 4302	809251
15pF	C106, 109	400106
18pF	C101	610122
20pF	C115	130130
30pF	C7104, 7105	24029
39pF	C102	130131
75pF	C110	800208
100pF	C124, 3115, 3116, 4103, 4104, 4429, 4430	24016
110pF	C114	24016
150pF	C4130	24017
220pF	C128, 208, 211, 3129, 3130	400107
330pF	C4423, 4424	24003
470pF	C3205, 3206	24004
680pF	C3119, 3120	809239
820pF	C4112, 4113, 4421, 4422	800209
0.001uF	C310, 3105, 3106, 4108, 4109, 4212, 4213	24027
0.002uF	C4208, 4209	809240
0.01uF	C104	24011
0.022uF	C103, 113, 119-123, 129, 130, 136-142, 502, 505-512, 3140, 7103	24013
0.2uF	C118	24019
Poly Capacitors (all rated 50V unless otherwise stated)		
150pF	C116	800235
350pF	C117	800236
820pF/125V	C3131	130106
1000pF	C203	130132
0.001uF	C212, 213, 8103, 8104	130133
0.0012uF	C3203, 3204	130134
0.0018uF	C3107, 3108, 4415, 4416	130135
0.0022uF	C3132, 3122, 4201, 4202	130136
0.0033uF	C3143, 3144	130137
0.0047uF	C3138, 4119, 4122	170437
0.0056uF/100V	C3155	170438
0.0068uF	C4413, 4414, 4427, 4428, (3127 3128)	170614
0.0082uF	C4114, 4115	170615
0.01uF	C132, 134, 3117, 4110, 4111	170439
0.015uF	C3127, 3128, 4425, 4426, (3134)	170441
0.027uF	C3109, 3110, 3209, 3210, 4407, 4408	130129
0.033uF	C4432, 4433	130129
0.039uF	C4419, 4420	170440
0.047uF	C202	170442
0.068uF	C133, 4405, 4406	170443
0.1uF	C4218, 4219	130127
0.12uF	C4120, 4123	130128

ELECTRICAL PARTS LIST

Value	Circuit Reference	Part No.
Electrolytic Capacitors		
0.1uF/50V	C107, 4417, 4418, 7107, 7110, 7111, 7114	800210
0.15uF/50V	C4411, 4412	130103
0.22uF/50V	C4203, 4204	800211
0.33uF/50V	C4409, 4410	810307
0.47uF/50V	C204, 205	809245
0.68uF/50V	C4403, 4404	130104
1uF/50V	C206, 209, 210, 3101, 3102, 3145, 3146 3201, 3202, 3208, 3215, 4101, 4102, 4105, 4106, 4133, 4135, 4136, 7108, 7109, 7112	20062
2.2uF/50V	C7113, 8201	809246
3.3uF/50V	C4127, 4128, 4134, 4401, 4402	20146
4.7uF/50V	C125, 3111-3114, 3125, 3126, 3213, 3214, 4129, 4205, 4206	20101
10uF/16V	C127, 201, 3117, 3118, 4431, 8102, 8202, 8203	20024
22uF/16V	C126, 4131, 4132	20025
47uF/10V	C4124, 4214, 4215, 7101, 7106	20053
47uF/16V	C4121, 4125	20027
100uF/10V	C3103, 3104, 3211, 3212	20028
100uF/16V	C4117, 4118	20028
220uF/10V	C207, 4210, 4211, 7102, 7115	20029
220uF/16V	C501, 3133, 3136, 3216, 4116, 8101	20029
220uF/35V	C4207	20055
470uF/10V	C135, 3132, 3207, 4126	20044
470uF/16V	C3139, 4107	20044
1000uF/10V	C143	130105
1000uF/25V	C504, 4216, 4217	20118
2200uF/35V	C503	20119

Circuit Reference	Description	Part No.
ICs		
IC101	BA4403	130107
IC102	BA4232AL	130108
IC201	BA1332	130109
IC3101, 3102	LA3160	901400
IC4101	TA7630P	800216
IC4201	STK4332	800217
IC4401-4404	UPC324C	800215
IC7101	OEC1001B	800218
IC7102	UPC324C	800215
IC8101, 8102	LB1403N	809207
Transistors		
Q101	KTC1923	50014
Q3101, 3102, 4101, 4102	KTC732TM/BC237	50016
Q3103	KTC2236/BD371	50018
Q3104, 3105, 3201-3204, 4104-4106, 7101-7103, 7108, 7111	KTC1815	170114
Q4103	KTC1627/BC237	50016
Q501	2SD880/2N5496	50005
Q7104-7107	KTC1015Y/BF595	50047

Circuit Reference	Description	Part No.
Diodes		
D101	Varicap ITT410B	920117
D102	Zener GZA6.8Y	809219
D103	GER OA90	800220
D104, 202, 7102	SIL KDS1555	800222
D201, 7101, 8101, 8102, 8103, 8201-8203	LED R SLP261B	130051
D4101	Sil BA243A	800219
D501	Zener GZA13Y	15005
D502-509	Rect IN4002	15008
D7103	Zener CZ-049	800221
D8104, 8105, 8204, 8205	LED G SLP161B	130050
Coils & Tx.		
L101	FMRF Coil 0031SU	300616
L102	FM Osc Coil OI703831	130111
L103	Bar Antenna	130020
L104	L.W. Osc Coil 0636001G	130112
L105	M.W. Osc Coil 0626001	130113
L106	FM IFT 1565SU	130114
L107	AM IFT 0640006	130115
L108	FM IFT 0605007	130116
L3101, 3102	Bias Trap Coil RB20299	300619
L3103	Bias Osc RB20866	300620
L3105, 3106	Bias Osc 1000uH	130117
T501	Power Tx.	130047
Filters & Traps		
CF101, 102	SFE 10.7MHz	993034
CF103	SFU 468B	800225
X7101	CSA 3.58MT	800229
Semi Fixed Resistors		
VR101	S.F. 10k	130120
VR201, 3105, 3106, 3202, 3203	S.F. 5k	130121
VR3101, 3102	S.F. 200k	130122
VR202	S.F. 2k	130123
VR3103	S.E. 10k	130124
VR3104 (Record Level)	S.L. 10k	130049
VR3201	S.F. 100ohm	130125
VR4101	S.F. 50k	130126
VR4401 (Tone Control)	S.L. 100k	130023
Miscellaneous		
F501	Fuse 2.5A (T)	S/800033
F502	Fuse 500mA (T)	S/88005
OS701	P.P.M. Sensor	800036
P.F.01	FM Ant Band Pass Filter PFWE4	130118
PF201, 202	Low Pass Filter B3BN4103-32	800228
P.V.C.101	PVC CB42J913	130015
TM701	Transmitter Hand Set	800061
TC101, 102	Ceramic Trimmer CTC-6U-010	130119
TC103, 104	Film Trimmer IT-16M	800227
TC105, 106	Film Trimmer IT-8M	800226

IC VOLTAGES

STK4332

1 - 7.4V DC
2 - 7V DC
3 - 0V DC
4 - 0V DC
5 - 14.78V DC
6 - 3.47V DC
7 - 29.6V DC
8
9 - 28.7V DC
10 - 3.7V DC
11 - 15.8V DC
12 - 0V DC
13 - 0V DC
14 - 7.3V DC
15 - 7.7V DC

BA-1332

A.M. F.M.
1 - 2.2V DC /
2 - 1.6V DC / 1.6V DC
3 - 1.6V DC / 1.6V DC
4 - 1.5V DC / 0.8V DC
5 - 1.6V DC / 1.6V DC
6 - 1.6V DC / 1.6V DC
7 - 1.6V DC / 1.6V DC
8 - 0V DC / 0.8V DC

A.M. F.M.
9 - 6.1V DC / 6.0V DC
10 - 1.6V DC / 1.6V DC
11 - 1.7V DC / 1.7V DC
12 - 1.7V DC / 1.7V DC
13 - 1.7V DC / 1.7V DC
14 - 5.5V DC / 5.5V DC
15 - 0V DC / 0V DC
16 - 0.3V DC / 0.3V DC

BA4232AL

A.M. F.M.
1 - 6.6V DC / 0V DC
2 - 6.6V DC / 0V DC
3 - 6.6V DC / 0V DC
4 - 6.6V DC / 0V DC
5 - 0V DC / 0V DC
6 - 6.0V DC / 5.9V DC
7 - 6.0V DC / 5.9V DC
8 - 6.0V DC / 5.9V DC
9 - 6.0V DC / 5.9V DC

A.M. F.M.
10 - 6.9V DC / 6.8V DC
11 - 2.0V DC / 2.1V DC
12 - 6.9V DC / 6.8V DC
13 - 0V DC / 0V DC
14 - 5.4V DC / 5.3V DC
15 - 0V DC / 0V DC
16 - 1.3V DC / 1.3V DC
17 - 0V DC / 0V DC
18 - 0V DC / 0V DC

BA4403

1 - 4.7V DC
2 - 5.4V DC
3 - 5.5V DC
4 - 0V DC
5 - 6.6V DC
6 - 6.7V DC
7 - 4.8V DC

OEC 3001

1 - 0V DC
2 - 0V DC
3 - 0V DC
4 - 0V DC
5 - 4.0V DC
6 - 4.0V DC
7 - 4.0V DC
8 - 4.0V DC
9 - 0V DC
10 - 0V DC
11 - 5.0V DC
12 - 0V DC
13 - 0V DC
14 - 0V DC
15 - 0V DC
16 - 5.0V DC
17 - 5.0V DC
18 - 5.0V DC
19 - 5.0V DC
20 - 0V DC
21 - 0V DC
22 - 2V DC
23 - 1.2V DC
24 - 5.0V DC
25 - 2.6V DC
26 - 2.5V DC
27 - 2.6V DC
28 - 2.4V DC
29 - 2.6V DC
30 - 2.4V DC
31 - 3.9V DC
32 - 1.2V DC
33 - 4.0V DC
34 - 0V DC
35 - 0V DC
36 - 0V DC
37 - 0V DC
38 - 0V DC
39 - 0V DC
40 - 0V DC
41 - 5.0V DC
42 - 5.0V DC

TA7630P

1 - 0V DC
2 - 6.1V DC
3 - 6.1V DC
4 - 6.1V DC
5 - 4.3V DC
6 - 6.1V DC
7 - 2.1V DC
8 - 1.3V DC
9 - 4.4V DC
10 - 3.2V DC
11 - 6.1V DC
12 - 12.3V DC
13 - 6.2V DC
14 - 6.1V DC
15 - 6.1V DC
16 - 6.1V DC

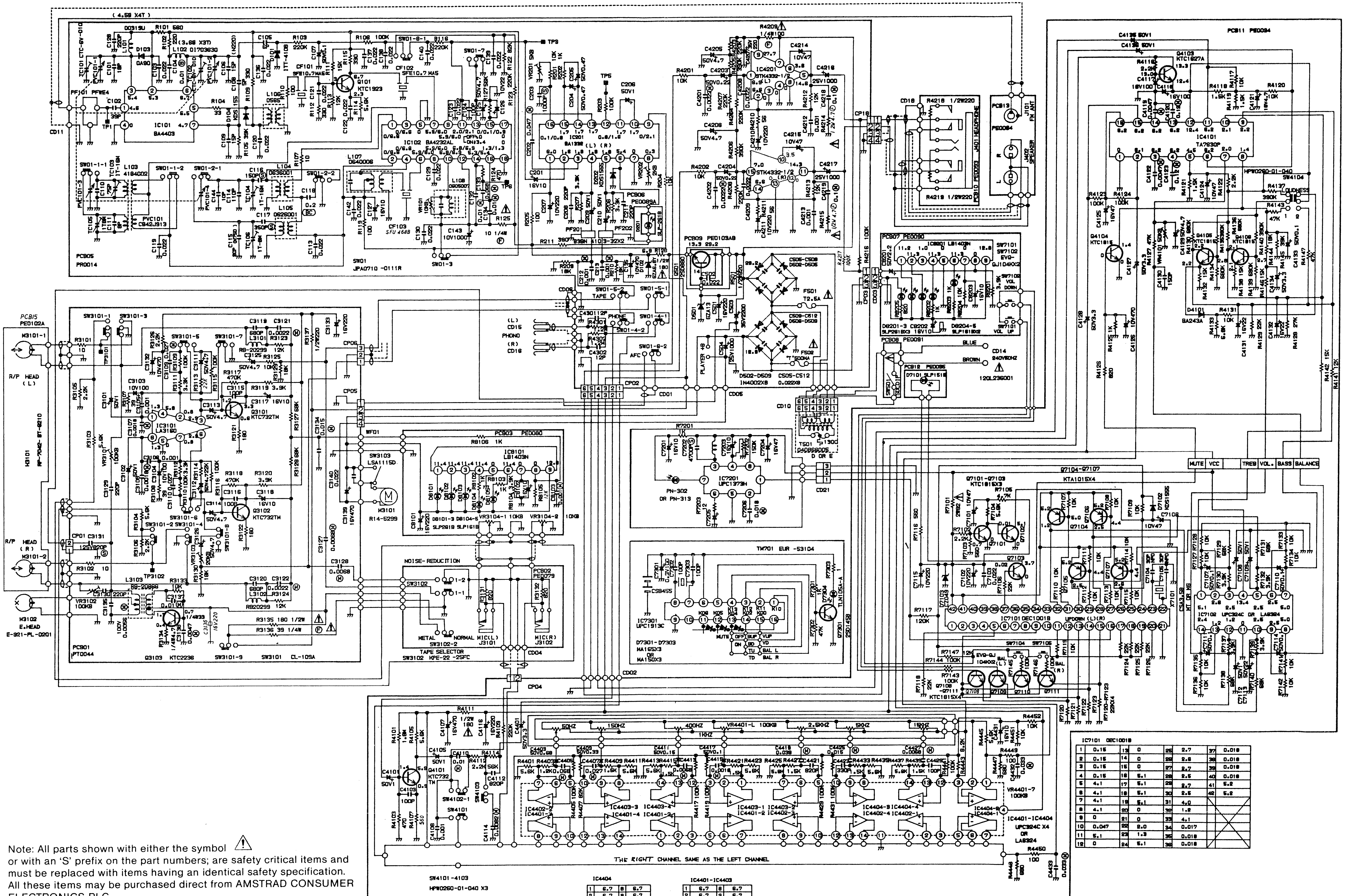
UPC324

1 - 6.6V DC
2 - 6.6V DC
3 - 6.6V DC
4 - 13.3V DC
5 - 6.6V DC
6 - 6.6V DC
7 - 6.6V DC
8 - 6.6V DC
9 - 6.6V DC
10 - 6.6V DC
11 - 0V DC
12 - 6.6V DC
13 - 6.6V DC
14 - 6.6V DC

LB1403

1 - 11.5V DC
2 - 11.5V DC
3 - 1.2V DC
4 - 11.5V DC
5 - 0V DC
6 - 11.5V DC
7 - 0V DC
8 - 0V DC
9 - 13.0V DC

TS86 CIRCUIT DIAGRAM


PCB05 PR0014
IC101 BA4403
IC102 BA4232AL
SW01 JPA0710 -0111R
IC201 BA1332 (L) (R)
PCB06 PE0089A
IC4201 STK4332-1/2
PCB09 PE0103AB
PCB07 PE0090
IC8201 LB1403N
PCB08 PE0091
PCB12 PE0095
PCB13 PE0094
J101 FM ANT
J402 SPEAKER
J401 HEADPHONE
PCB11 PE0094
IC4101 TA7630P
HPW0260-01-040
PCB15 PE0102A
R/P HEAD (L)
R/P HEAD (R)
H3101 RP-7042-BT-0210
H3102 E.HEAD E-921-PL-0201
PCB01 PT0044
IC3101 LA3160
Q3103 KTC2236
SW3101 CL-109A
PCB03 PE0080
IC8101 LB1403N
M3101 R14-5299
NOISE-REDUCTION
TAPE SELECTOR SW3102 KPE-22-25FC
PCB02 PE0079
MIC(L) J3101
MIC(R) J3102
IC7201 UPC1373H
PN-302 OR PN-313
TM701 EUR-53104
IC7301 UPC1913C
D7301-D7303 MA165X3 OR MA150X3
Q7101-Q7103 KTC1815X3
Q7104-Q7107 KTA1015X4
IC7101 OEC1001B
IC7102 UPC324C OR LA6324
Q7108-Q7111 KTC1815X4
MUTE
VCC
TREB
VOL.
BASS
BALANCE
IC4401-IC4404 UPC324C X4 OR LA6324
VR4401-7 100KB
SW4101-4103 HPW0260-01-040 X3
THE RIGHT CHANNEL SAME AS THE LEFT CHANNEL

IC7101 OEC1001B

1	0.15	13	0	25	2.7	37	0.018
2	0.15	14	0	26	2.6	38	0.018
3	0.15	15	0	27	2.7	39	0.018
4	0.15	16	5.1	28	2.5	40	0.018
5	4.1	17	5.1	29	2.7	41	5.2
6	4.1	18	5.1	30	2.5	42	5.2
7	4.1	19	5.1	31	4.0		
8	4.1	20	0	32	1.2		
9	0	21	0	33	4.1		
10	0.047	22	2.0	34	0.017		
11	5.1	23	1.3	35	0.018		
12	0	24	5.1	36	0.018		

Note: All parts shown with either the symbol ⚠ or with an 'S' prefix on the part numbers; are safety critical items and must be replaced with items having an identical safety specification. All these items may be purchased direct from AMSTRAD CONSUMER ELECTRONICS PLC

IC4404

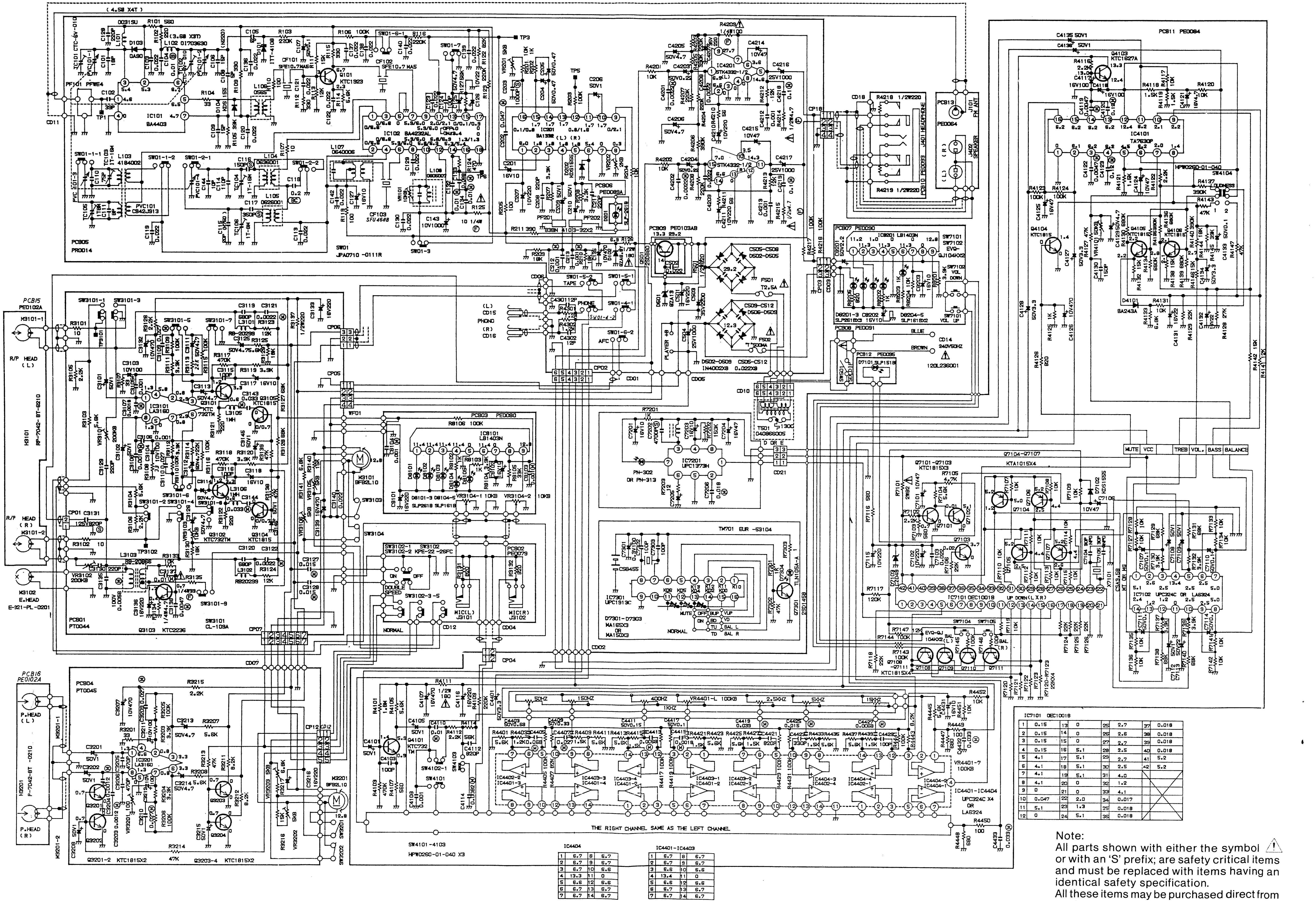
1	6.7	8	6.7
2	6.7	9	6.7
3	6.7	10	6.6
4	13.3	11	0
5	6.6	12	6.6
6	6.7	13	6.7
7	6.7	14	6.7

IC4401-IC4403

1	6.7	8	6.7
2	6.7	9	6.7
3	6.6	10	6.6
4	13.4	11	0
5	6.6	12	6.6
6	6.7	13	6.7
7	6.7	14	6.7

TS-86 1-2495

TS87 CIRCUIT DIAGRAM


PCB05 PR0014
IC101 BA4403
IC102 BA4232AL
IC201 BA1332
SW01 JPA0710 -0111R
PCB06 PE0089A
PCB09 PE0103AB
IC4201 STK4332
PCB07 PE0090
IC8201 LB1403N
PCB13 PE0064
J101 FM ANT
J401 HEADPHONE
J402 SPEAKER
PCB10 PE0093
PCB11 PE0084
IC4101 TA7630P
PCB15 PE0102A
H3101 RP-7042-BT-0210
R/P HEAD (L)
R/P HEAD (R)
H3102 E.HEAD E-921-PL-0201
PCB01 PT0044
IC3101 LA3160
SW3101 CL-109A
Q3103 KTC2236
PCB03 PE0080
IC8101 LB1403N
M3101 BFB2L10
PCB02 PE0079
MIC(L) J3101
MIC(R) J3102
NORMAL
DOUBLE SPEED
PCB08 PE0091
PCB12 PE0095
D7101 SLP1518
T501 0408660005
IC7201 UPC1373H
PN-302 OR PN-313
TM701 EUR -53104
IC7301 UPC1913C
Q7301 2SD1458
IC7101 OEC10018
IC7102 UPC324C OR LA6324
Q7101-Q7103 KTC1815X3
Q7104-Q7107 KTA1015X4
MUTE VCC TREB VOL. BASS BALANCE
PCB16 PE0102A
P.HEAD (L)
P.HEAD (R)
H3201 P-7042-BT-0210
PCB04 PT0045
IC3201 LA3160
Q3201-2 KTC1815X2
Q3203-4 KTC1815X2
M3201 BFB2L10
SW4101-4103 HPW0260-01-040 X3
50HZ 150HZ 400HZ 1KHZ 2.5KHZ 5KHZ 15KHZ
VR4401-L 100KB
IC4401-IC4404 UPC324C X4 OR LA6324
THE RIGHT CHANNEL SAME AS THE LEFT CHANNEL

IC7101 0EC10018

1	0.15	13	0	25	2.7	37	0.018
2	0.15	14	0	26	2.6	38	0.018
3	0.15	15	0	27	2.7	39	0.018
4	0.15	16	5.1	28	2.5	40	0.018
5	4.1	17	5.1	29	2.7	41	5.2
6	4.1	18	5.1	30	2.5	42	5.2
7	4.1	19	5.1	31	4.0		
8	4.1	20	0	32	1.2		
9	0	21	0	33	4.1		
10	0.047	22	2.0	34	0.017		
11	5.1	23	1.3	35	0.018		
12	0	24	5.1	36	0.018		

IC4404

1	6.7	8	6.7
2	6.7	9	6.7
3	6.7	10	6.6
4	13.3	11	0
5	6.6	12	6.6
6	6.7	13	6.7
7	6.7	14	6.7

IC4401-IC4403

1	6.7	8	6.7
2	6.7	9	6.7
3	6.6	10	6.6
4	13.4	11	0
5	6.6	12	6.6
6	6.7	13	6.7
7	6.7	14	6.7

Note:
All parts shown with either the symbol ⚠ or with an 'S' prefix; are safety critical items and must be replaced with items having an identical safety specification.
All these items may be purchased direct from AMSTRAD CONSUMER ELECTRONICS PLC.